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ABSTRACT OF THE DISCLOSURE

An illumination optical apparatus for illuminating an object to be illuminated in an arcuate or rectangular shape. A first optical integrator forms a plurality of light source images in a substantially linear arrangement, based on a beam of parallel rays. Then a second optical integrator forms a plurality of light source images in a substantially square arrangement, based on the beam from the first optical integrator. A relay optical system is disposed between the first and second optical integrator, and makes a position of the light source images formed by the first optical integrator conjugate with a position of the light source images formed by the second optical integrator.